



Chico

**Golden
Empire
Amateur
Radio
Society, Inc.**

www.gearsw6rhc.org

"Dedicated to Public Service"

THE RADIATOR



W6RHC
IRLP #8170



P.O.Box 202 Chico, CA 95927

March 2022 Newsletter

GEARS Founded August 13, 1939

Greetings from the President

Well, here we are in March already. So many tree blossoms have greeted us and graced us with great beauty, reminding us SPRING is on the way. Mrs. Stewart and I along with Emmi, our granddaughter, had a lovely February RV trip. We spent the third week in our travel trailer at Laguna Seca near Monterey, CA. The weather was great, some HAM friends from the Palmdale, CA, area met us and the fellowship was tremendous. We love traveling in our trailer. As February was approaching the weather in Chico was just great, as March approached the night temperatures turned cold. I trust no one had water problems caused by freezing pipes.

February brought some unique opportunities for the club. Our usual meeting location was unavailable for the February meeting so we began searching for a substitute location. As it happened Rich, N3UOR, offered his building and there we held our February meeting. I hear the meeting was good as Kent, WA6ZFY, our Vice President managed the meeting, and shared a good presentation regarding DIGIPEATERS. Thank you, Kent. Also, Rich thank you for being there and generously sharing your building with GEARS we all appreciate your support.

GEARS is still evaluating possible locations for future meetings. If you have any ideas, such as apartment or mobile home park social meeting rooms or churches, please share these possibilities with us.

Our Annual Auction, time and location, is getting nailed down. Saturday May 21, 2022 will be the date. It is anticipated to be at the Masonic Temple on East Ave. Please share with your friends and be certain to let all HAM RADIO clubs you are affiliated with know about this auction. This is a fun time and the Auction will be the May GEARS meeting.

Kathy Favor says the Wildflower is back on for 2022. The ride will be on Sunday April 24th. We are working with BCSCR and Velo to map out where we need to place ham radio volunteers. We hope to have all (or most) the details available at the March meeting.

I truly appreciate how the members "STEP-UP" when opportunities arrive. Many have volunteered and helped regarding preparations for upcoming events. These contributions make GEARS a truly wonderful organization. THANK YOU ALL.

I hope we are all able to appreciate and enjoy the natural beauty and loveliness as the "Roar of March" ushers us to the beginning of spring.



'73

Paul Stewart N6PAS
n6pas1@gmail.com



Join GEARS on Facebook
www.facebook.com For
timely news and additional
information.

March 2022 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 7pm PARS Net 7:30pm GEARS Net	2	3 7:30pm Simplex Net	4	5
6 8pm OARS Net 2pm VEC Testing	7 7pm GARS Net 8pm ARES Net	8 7pm PARS Net 7:30pm GEARS Net	9	10 7:30pm Simplex Net	11 7pm OARS meeting 7pm GARS meeting	12 9am Chico Breakfast
13 8pm OARS Net	14 7pm GARS Net 8pm ARES Net	15 7pm PARS Net 7:30pm GEARS Net	16	17 7:30pm Simplex Net	18 7pm GEARS Meeting	19
20 8pm OARS Net	21 7pm GARS Net 8pm ARES Net	22 7pm PARS Net 7:30pm GEARS Net	23	24 7:30pm Simplex Net	25	26 9am OARS Breakfast
27 8pm OARS Net	28 7pm GARS Net 8pm ARES Net	29 7pm PARS Net 7:30pm GEARS Net	30	31 7:30pm Simplex Net		

VEC Testing, FCC License Exam available by appointment. For information or registration call Tom Rider, W6JS 530-514-9211

Chico Breakfast 2nd Saturday 9am Farmers Skillet Cohasset Rd, Chico

GEARS Board Meeting 1st Monday 7pm by zoom.

PARS Meeting 2nd Thursday 6:30pm, doors open 6pm Old Magalia Community Resource Center

OARS Meeting Second Friday of the month, St. Pauls Episcopal Church Hall, Oroville.

GARS Meeting Second Friday of the month, Lutheran Church Hall, Artois.

Butte ARES Meeting 3rd Tuesday, TBD Contact Dale Anderson, KK6EVX 826-3461 for more information.

GEARS Meeting, 3rd Friday of the month, Eyeball QSO 6pm, meeting at 7:00 pm. Scuba Hut, Chico

OARS Breakfast 4th Saturday of the month, at Cornucopia of Oroville.

NETS:

OARS Club Net Sunday 8pm 146.655 Mhz - PL 136.5

GARS Club Net Monday, 7:00 pm 147.105 MHz + PL 110.09, secondary: 146.850 MHz-PL 110.9

Butte ARES Net Mondays 8pm 145.290 MHz - PL 110.9

Yuba Sutter Club Net Monday 7pm 146.085 MHz + PL 127.3

GEARS Club Net Tuesdays 7:30 PM 146.850 MHz - PL 110.9

PARS Club Net Tuesday 7pm 145.290 - PL 110.9

Simplex Net Thursday 7:30 p.m. 146.52 no tone

Yuba Sutter ARES Net Thursdays 7pm 146.085 MHz + PL 127.3

Sacramento Valley Traffic Net Nightly 9:00 PM 146.850 MHz - PL 110.9

GEARS Century Members

Dale Anderson, Kathy & Michael Favor

Kent Hastings, Bennett Laskey, Jim Van Sickle

We thank these members for their extra support.

GEARS NEWS

Due to changes with the Sheriff Search and Rescue Training, we will no longer have access to the SARS Building. We are looking for a new location for our meetings and VEC Testing. For the time being we will be meeting at Scuba Hut, 2725 CA-32 Nord Ave, Chico, CA 95973.



If you know of another location in Chico where we could meet, please contact Paul Stewart N6PAS n6pas1@gmail.com

Copper Strap vs. Copper Braid in Amateur Radio Grounding

Tinned-copper braid has been around for a long, long time. It's been used in many grounding applications because of its flexibility and ease of soldering. It's great for grounding radio chassis to radio chassis or from your equipment to a single-point ground. Good stuff.



Copper strap is better than wire because it reduces RF skin effect with the very large surface area it presents.

There is a problem with braid: it retains water. The fact that it will hold water causes corrosion to the tinning material and, eventually, the copper. This may not be a problem in New Mexico but it is in many parts of the US and the World. Tinned-copper corrosion is evident when the braid begins to turn green.

That's where copper strap comes in! For grounding connections that go outside the building and into the weather, the better choice is copper strap. Copper strap dries quickly, its oxidation actually protects the strap, and it will far outlast copper braid when used for the same outdoor application. Copper strap also reduces RF skin-effect resistance over the use of wire.

So, which is best? Both! Use convenient and flexible braid in the shack to accomplish your equipment grounding needs. Then transition to copper strap to go outside the shack and into the weather.

From Onallbands.com

Operating on the Low Bands—160 and 80 Meters

By Mark Haverstock, K8MSH

There are very good reasons why you should use the 160 and 80 meter bands. They are usually the least likely to fail under adverse propagation conditions. In times of regional disasters when a repeater is down, they can provide a reliable alternative. Both are suitable for NVIS (Near Vertical Incidence Skywave) mode propagation for local contacts.

These bands provide the best coverage at nighttime. Signals on 160 and 80 meters make fairly rapid transitions around dawn and dusk. Signals between stations operating on 160 and 80 meters often exhibit a peak in signal strength when the easternmost stations are close to sunrise—this is known as the dawn enhancement. It's a good time for stations to be on the air and take advantage of the stronger signals and chase DX.

160 Meters

In the early days of radio, it was believed that anything above 200 meters was unusable, so amateurs were allowed to experiment with the leftover frequencies nobody wanted. Amateurs began with frequency allocations from 200 meters to 150 meters (1.5 MHz to 2 MHz). To accommodate the growing number of AM broadcast stations and other services, the 160 meter band was eventually changed to 1.8 to 2.0 MHz.

Known as “top band,” 160 meters is usually considered part of the HF bands and is the lowest frequency band commonly in use by amateurs, though it's technically an MF (medium frequency) band. Most modern HF radios cover 160 meters, providing hams with an introduction to the band.

It's also known as “The Gentleman's Band” for a good reason. The QSOs are casual and people generally treat each other with respect. If you want to hear what amateur radio was like years ago, give it a try. You'll experience less crowding and better manners.

The primary reason you won't hear much traffic on 160 meters is due to antenna requirements. A 160 meter vertical is huge at 123 feet tall; an inverted V or dipole is massive at 246 feet long. Not all amateurs have enough real estate to accommodate them. But there's good news—you can fit a full-sized 160 meter antenna in a small 100 x 60 foot lot without loading coils or complicated matching systems. An inverted L is a solution that has a relatively small footprint and works well with a few radials.

At night, when the D-layer in the ionosphere disappears, communication distances increase and it may be possible to hear stations several hundred or more miles away. Grey line, the area where night and day meet, is important for propagation on 160 meters. Grey line is also known as the terminator. Stations in this grey line zone have an increased chance of making long-distance QSOs, especially if the other station is also in a grey line zone. Ducting, where the signal propagates along the ionosphere rather than repeated hops between ground and the F-layer, appears to be another contributor to long-distance propagation on 160 meters.

The 160 meter band utilizes lower sideband (LSB) for voice and includes all the other popular modes like CW and digital (see Table 1 at end of article). It's a regional band with good ground wave coverage for nearby contacts, but under the right conditions it can open up. If you're only interested in local QSOs (rag-chewing, nets, etc.), then 160 meters is good just about anytime. If you want to work DX on 160 meters, some persistence, time, and effort are required. An amplifier also helps.

Unlike the higher HF bands, long-distance propagation for this band is often better around sunspot minimum when solar activity is low and noise levels are lower. As a general rule, the probability of long-distance contacts improves in winter because of the longer hours of darkness and lower levels of static. December through March is prime time for this band. It's also when the 160 meter contests are scheduled.

80 Meters

Because 160 meters is relatively close in frequency to 80 meters, you would assume the two would have very similar propagation characteristics. But there are some significant differences in coverage.

During the day, stations up to a few hundred miles away can be heard, making 80 meters a better choice for medium-distance contacts than 160. At night, you can pull in ham radio stations from distances of 1,000 miles or more. Greater distances can be achieved with good antennas and higher transmitting power. The 80 meter band opens up during the years of the sunspot minimum, but it can perform well at anytime.

The 80 meter band has numerous evening nets operating on LSB. It's also very popular for rag-chewing. If chatting with other hams in the evening for an hour or two interests you, check out 80 meters. However, be aware that you'll sometimes run across some loose cannons and LIDS (rude operators)—it's best to avoid them.

There's plenty of room for other modes, given that the total amount of spectrum space is more than double that of 160 meters at 500 KHz. You'll find digital, CW, RTTY, SSTV, and AM (see Table 1). With dipole antenna sizes around 125 feet in length, this is often the lowest band on which many amateurs choose to operate.

As far as 80 meter propagation along the gray line, you can achieve good results when contacting stations from the other side of the globe, with signal strengths rivaling those of many local stations. However, this can be short-lived and selective in terms of location. Grey line propagation tends to be best during spring and autumn on 80 meters.

QRN: Good News/Bad News

In general, 160 and 80 meters are best at night—a viable alternative to other HF frequencies 15 meters and above following sunset. However, they sometimes suffer from interference.

There are two sources of noise that make receiving difficult: man-made and atmospheric. The primary problem is thunderstorm activity, which can make copying signals a challenge. Lightning creates radio noise that is reflected off the ionosphere just like regular radio signals. However, the good news is thunderstorm activity drops off during the winter, allowing good 160 and 80 meter operating conditions.

The combination of day/night, summer/winter, and sunspot cycle variations keeps HF operation on 160 and 80 meters interesting. You may be surprised at what you'll find when you tune across these bands.

Table 1—ARRL Band Plan: Where and what is on the bands.

160 Meters (1.8-2.0 MHz)	80 Meters (3.5-4.0 MHz)
1.800 – 2.000: CW	3.590: RTTY/Data DX
1.800 – 1.810: Digital Modes	3.570-3.600: RTTY/Data
1.810: CW QRP	3.790-3.800: DX window
1.843-2.000: SSB, SSTV and other wideband modes	3.845: SSTV
1.910: SSB QRP	3.885: AM calling frequency
1.995 – 2.000: Experimental	
1.999 – 2.000: Beacons	

Off-Center Fed (OCF) Antenna: Multitalented or Misunderstood?

By Mark Haverstock, K8MSH

The Off-Center Fed dipole (OCF)—also called a Windom by many—has received mixed reviews among amateur radio operators. Although thousands of hams use and love these multi-band antennas, some people, including a few well-known antenna experts, view the OCF as a common mode current (CMC) generator or even an outdoor dummy load. But if built properly, the OCF is a great multi-band antenna that is ideal for hams who have limited space.



A ham friend of mine calls it an OCD antenna, poking fun at the lengths to which some hams will go to find the perfect feedpoint. In reality, it is one of the simplest and most economical antennas, and its length is comparable to a conventional dipole. This multi-band antenna doesn't require traps, loading coils, or a tuner on its operational bands.

History

It was Loren Windom and several others at Ohio State University who discovered how changing the feedpoint would affect the coverage and performance of an antenna. The original Windom antenna from the late 1920s was an off-center fed resonant dipole with a single wire feedline of any length. It was intended to be used on one frequency only. Its main advantage was that it could easily be matched to a tube transmitter. Today's versions, based on the original Windom, include the common OCF and Carolina Windom.

How it Works

Like most HF antennas, the OCF is based on the dipole. By measuring impedance between the center and the ends of the dipole, you may find impedances between 73 and 3,000 ohms. For the OCF, the goal is to determine a point where the impedance is low enough to be usable on multiple bands. You can accomplish this with a feedpoint placed somewhere between 45 and 20 percent of the total length from one end of the antenna.

OCF antennas begin with a radiation pattern similar to a conventional dipole at its fundamental frequency, but differ on the harmonic bands. In the illustration below, you can see that the figure 8 pattern splits into multiple lobes on the higher bands.

In real life, however, the nulls are not as deep as the picture implies.

Installing the OCF

There are tricks to improving the performance and band coverage on an OCF once you've settled on the location of your feedpoint.

Distance above ground affects impedance—the higher the feedpoint, the higher the impedance. Typically, most instructions suggest the feedpoint be at 30 or more feet above ground level. Several sources suggest switching to a 6:1 balun if the antenna height is 70 feet or more.

Keep the OCF antenna clear of surrounding objects as much as possible, eMany OCF antennas are constructed according to a standard formula which places the feedpoint one-third of the way from one end, making two elements: one 33% and the other 67% of the total length. This results in low SWR on the lowest fundamental frequency for which the antenna is cut, and also on the even harmonics of that fundamental frequency—unlike a dipole which favors odd harmonics.

The OCF dipole presents a reasonably good match to the transmitter across multiple bands, which are even harmonics of the fundamental frequency, including 80, 40, 20, 12, 10 and 6 meter bands. Feeding the OCF dipole at a point that is one-third of its length from one end typically yields a higher feedpoint impedance, approximately 200-300 ohms, as compared to the center-fed half wave dipole at 73 ohms. Most OCF antennas use a 4:1 impedance transformer at the feedpoint to match 50 ohm coax.

It seems that many OCF builders have found their own “sweet spot” through experimentation. For example, some hams have reported choosing a 20%-80% split in conjunction with a 4:1 current balun, providing a usable antenna on 80, 40, 30, 20, 15, 12, and 10 meters, with SWR readings less than 2:1 on these bands.

pecially metal. They can be installed as a flat-top or inverted-V. The inverted-V should have an inside angle of no less than 120 degrees between the elements, and each element end needs to be at least 8-10 feet above ground. Whenever possible, run your coax an equal distance away from both legs of the OCF antenna as far as possible—don't run it parallel to the antenna.

Adding a vertical component can enhance performance by lowering the angle of radiation. The Carolina Windom is a variation of the OCF with a choke balun (line isolator) placed 22 feet below the 4:1 balun on an 80-10m off-center fed antenna. This allows the 22 foot vertical section of feedline to act as a radiator. The radiation pattern when using this vertical radiator combines both horizontal and vertical radiation components and lowers the effective angle of radiation, getting more of your signal near the horizon.

Performance

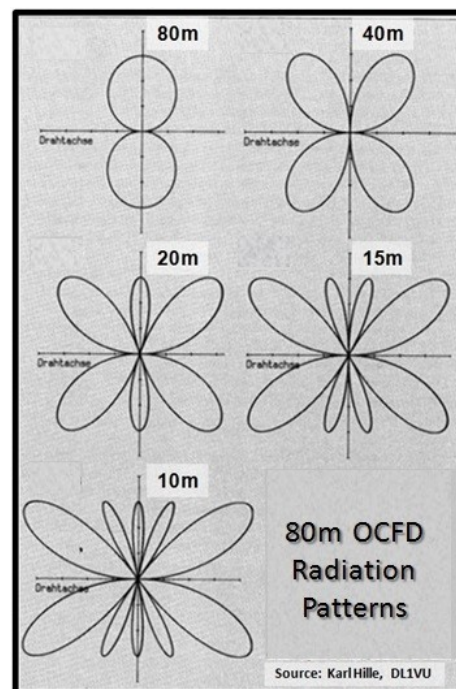
Essentially, an OCF dipole is just a dipole which is not fed at its center; it performs much like a center-fed dipole. It provides multi-band operation on even harmonics, often without using a tuner/matchbox. Overall antenna system losses are lower because lower SWR on the OCF's operating frequencies means less feedline loss and lower losses from using a tuner/matchbox, while presenting a good match to the transmitter.

OCF Antenna Advantages

- A single antenna will cover almost all HF bands
- Lowest cost per band compared to any good multi-band antenna
- Low radiation angle with good efficiency
- SWR generally well under 3:1 on most bands, except for 80/75m where a tuner is helpful. (This is typical of all 80m dipoles)
- No need for a separate matchbox. The transceiver's built-in ATU will usually work to minimize SWR

Disadvantages

- The SWR is not the same on all bands; it varies on each band
- Resonant frequency is not independently adjustable by band
- The off-center feeding results in an increase of common mode current trying to flow down the outer shield of the coax. With proper choking, this can be held in check, at least for moderate power levels up to 1kW
- The OCF has somewhat more pronounced nulls in its radiation pattern than a doublet on its harmonic frequencies



GEARS Officers:

President.....Paul Stewart, N6PAS
Vice-President.....Kent Hastings, WA6ZFY
Secretary.....Steven Wright, KM6DBS
Treasurer.....Jim Matthews, K6EST
Director.....Bennett Laskey, K6CEL
Director.....Dale Anderson, KK6EVX
Director.....Rich Astley, N3UOR
Past President.....Jim Matthews, K6EST
VEC.....Tom Rider, W6JS
ARES.....Dale Anderson, KK6EVX

GEARS Dues and Donations can be made online at

paypal.me/w6rhc

Or by mail to:

GEARS

PO Box 202

Chico, CA 95927

Your dues and contributions support our local repeaters, ARES, and outreach events to keep amateur radio alive in our area. GEARs also makes donations to support other local repeaters.

GEARS Newsletter edited by Jim Matthews K6EST

JiminChico@yahoo.com

Sierra Foothills Amateur Radio Club's - W6EK.ORG

Loomis Hamfest 2022 Saturday, March 19st

First Swap of the Year - Rain or Shine

Historic Loomis Train Depot
5775 Horseshoe Bar Road, Downtown Loomis

7th Annual Loomis Hamfest
Meet & Greet Everyone - Visit
the ARRL Booth - Door Prizes
Hourly -- Free Parking

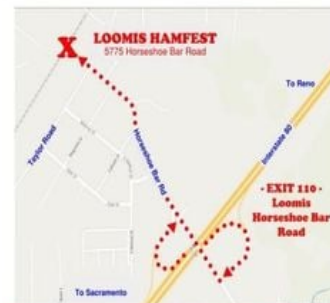


Elmer Tours - Test Bench - Hot
Coffee and Donuts - Taylor's
Lunch Deal - SFARC Club Table
Buyers 7 AM - Noon
Sellers 6 AM

Grand Prize @ 11 AM



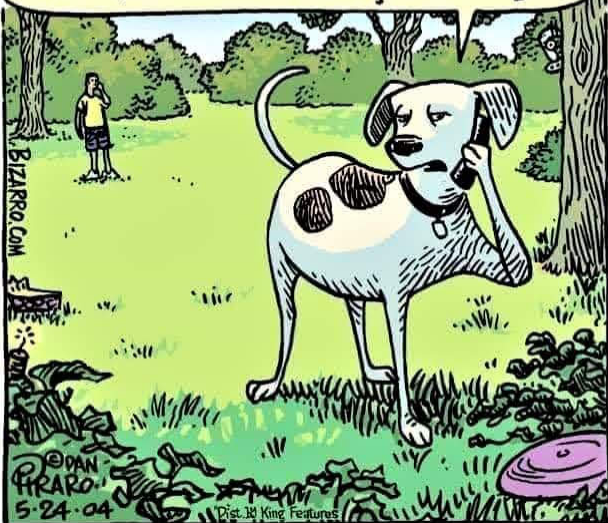
SFARC is an ARRL Affiliated and Special Service Club. ARRL is the
National Organization Representing Amateur Radio Operators. Stop by
the ARRL Booth and visit with Dr. Carol Milazzo, KP4MD,
Sacramento Valley Section Manager.



Talk-In - W6EK 145.430 PL 162.2 Hz - Talk-In

revised 1/26/2022

Hey, it's me. I can't find the ball
you sent me after, but I found a
Frisbee. You want me to bring that
back, or should I keep looking?



© Randy Glasbergen / glasbergen.com



You have over \$20,000.00 worth of
radio gear and you want to watch
me chase a stick?